

Exhibit 86

SPACEFLIGHT NOW

The leading source for online space news



Go!

Mission Status Center

BY JUSTIN RAY

Follow the mission of space shuttle Columbia on its 16-day science research flight with our Mission Status Center.

FRIDAY, JANUARY 31, 2003

Columbia commander Rick Husband, pilot William McCool and flight engineer Kalpana Chawla tested the shuttle's re-entry systems today, setting the stage for landing Saturday to close out a 16-day science mission. Touchdown on runway 33 at the Kennedy Space Center currently is targeted for 9:15:50 a.m. EST. Read our [full story](#).

THURSDAY, JANUARY 30, 2003

Astronauts aboard the Space Shuttle Columbia are completing their final runs on experiments in the Spacehab Research Double Module and beginning preparations for Saturday's landing.

Most of the 80 experiments already have completed their data collection, and today was the last day for the remaining investigations, in particular the Water Mist Fire Suppression Experiment (MIST), the Mediterranean Israeli Dust Experiment (MEIDEX) and the Advanced Respiratory Monitoring System (ARMS).

MIST, which got a late start due to problems setting up the test chamber, is nearing its 30th run as it studies the effectiveness of fog-like water droplet concentrations in putting out flames. The experiment is sponsored by the Center for Commercial Applications of Combustion in Space at the Colorado School of Mines in Golden as part of continuing program to design replacements for environmentally hazardous chemicals such as Halons.

MEIDEX will be recording its final data takes of lightning "sprites" and "elves," after successfully imaging a major dust concentration in support of its primary objective to study how fine dust particles, or aerosols, affect the Earth's environment. MEIDEX was sponsored by the Israeli Space Agency and Tel-Aviv University in association with Payload Specialist Ilan Ramon's first space flight for an Israeli.

Crewmembers also began wrapping up and storing the final blood, urine and saliva samples they are providing for studies of human physiology associated with the ARMS cardiovascular experiments and the Physiology and

Pad panorama



As the rotating service structure swung away from space shuttle Columbia at Kennedy Space Center's launch pad 39A Wednesday afternoon, Spaceflight Now was there to capture this 360-degree panorama. Available to our Spaceflight Now Plus subscribers.

- [VIEW](#) (QuickTime)
- [SUBSCRIBE NOW](#)

Station Calendar

NEW! This beautiful 12" by 12" wall calendar features stunning images of the International



Space Station and of the people, equipment, and space craft associated with it, as it takes shape day by day in orbit high above the Earth.

- [U.S. STORE](#)
- [U.K. & WORLDWIDE STORE](#)

Apollo 17 DVDs

NEW! The final lunar mission to date, the journey of Apollo 17, occurred 30 years ago this month. The mission is captured in this spectacular six- and two-disc sets. Pre-order today and save!



- [U.S. STORE](#)
- [U.K. & WORLDWIDE STORE](#)

Apollo 8 leaves the cradle

NEW! The December 1968 journey of the Apollo 8 crew into lunar orbit is relived in this unique three-disc DVD set. Pre-order today and save!



- [U.S. STORE](#)
- [U.K. & WORLDWIDE STORE](#)

Biochemistry Team experiments. The samples will be kept at appropriate temperatures in refrigeration systems in the Spacehab module for return to Earth and further study.

And the Biotube experiment, which was activated Wednesday, looked at flax seeds as they grew in the presence of strong magnetic field. Scientists on the ground used video downlinks to monitor the length of root growth to ensure appropriate fixation times.

Commander Rick Husband and Flight Engineer Kalpana Chawla of the day shift took turns simulating landing on the PILOT computer-based training system. Pilot Willie McCool of the night shift will get in his practice session overnight. Landing is scheduled for 9:16 a.m. EST Saturday and preliminary forecasts show excellent conditions at the Shuttle Landing Facility in Florida. If weather decides not to cooperate, there are plenty of supplies to support the crew until conditions are favorable.

Husband also peeked under the floor of the Spacehab module to look for water that might have leaked out of the balky air-conditioning system earlier in the mission. He reported finding no moisture that could contaminate Spacehab systems if jostled during Saturday's re-entry and landing, but covered several holes in the water sub-assembly with tape as a precaution.

WEDNESDAY, JANUARY 29, 2003

Columbia's seven astronauts took a break from their around-the-clock scientific research today to answer reporters' questions in the traditional on-orbit crew news conference.

Commander Rick Husband, Pilot Willie McCool, Mission Specialists Dave Brown, Kalpana Chawla, Michael Anderson and Laurel Clark, and Israel Space Agency Payload Specialist Ilan Ramon fielded questions about how their shuttle was performing as a research laboratory, their work in support of the STS-107 mission's 80 different experiments and preparations for Saturday's planned landing.

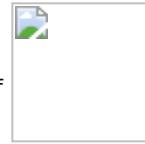
"The science we're doing here is great and it's fantastic," said Anderson, the payload commander, "it's leading edge. But I think once we get a seven-member crew on board the space station you're really going to see some outstanding science in space. A lot of experiments that we have are really just being demonstrated and developed. Once they're fully developed they'll reside on board the space station and the scientists ♦? will have years to conduct the experiments that we're trying to do here in a relatively short period of time."

Ramon reported that dust storms off the east coast of Africa were scarce for the first week of the flight, but that a giant dust storm kicked up over the Atlantic and lasted three days,

Hubble Calendar

NEW! This remarkable calendar features stunning images of planets, stars, gaseous nebulae, and galaxies captured by NASA's orbiting Hubble Space Telescope.

- [U.S. STORE](#)
- [U.K. & WORLDWIDE STORE](#)



Hubble Posters

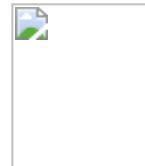
Stunning posters featuring images from the Hubble Space Telescope and world-renowned astrophotographer David Malin are now available from the Astronomy Now Store.



- [U.S. STORE](#)
- [U.K. & WORLDWIDE STORE](#)

New DVD

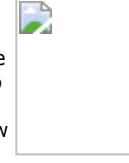
The conception, design, development, testing and launch history of the Saturn I and IB rocket is documented in this forthcoming three-disc DVD.



- [U.S. STORE](#)
- [U.K. & WORLDWIDE STORE](#)

The ultimate Apollo 11 DVD

NEW 3-DISC EDITION This exceptional chronicle of the historic Apollo 11 lunar landing mission features new digital transfers of film and television coverage unmatched by any other.



- [U.S. STORE](#)
- [U.K. & WORLDWIDE STORE](#)

providing ample observations for the Mediterranean Israeli Dust Experiment. He voiced wishes for peace in his area of the world from 180 miles above.

"The world looks marvelous from up here, so peaceful, so wonderful and so fragile," Ramon said. "The atmosphere is so thin and fragile, and I think all of us have to keep it clean and good. It saves our life and gives our life."

After a 3:39 p.m. EST Blue Team wake-up to the sounds of John Lennon singing "Imagine," McCool and Ramon said their observations from orbit reveal no borders on the Earth below and reiterated in both English and Hebrew their hopes for peace in the world.

Initial tests in the Combustion Module Facility with the newly revitalized Water Mist Fire Suppression Experiment took center stage today, with 14 sample runs completed after Chawla fixed a balky seal in the combustion module yesterday. Another 20 runs are planned before the end of the mission on tests designed to learn exactly how the water interacts with flames as it is extinguishing them.

TUESDAY, JANUARY 28, 2003

The Red team of astronauts aboard the Space Shuttle Columbia accomplished repairs on the third and final combustion experiment of STS-107 this afternoon, and support scientists on the ground were looking forward to working with the Blue team on the first scientific runs.

Mission Specialist Kalpana Chawla reported a good leak check of the Combustion Module-2 Facility about 5 p.m. EST after five hours of work. She and Commander Rick Husband sent down video of the recovery procedures for the Water Mist Fire Suppression Experiment (MIST) around 3 p.m. to give engineers on the ground an opportunity to visually inspect the equipment. The combustion facility, which provides control, containment, diagnostics and communications for fire-related experiments, worked flawlessly in support of the two previous combustion experiments, but failed its initial leak checks when MIST was installed Monday.

Payload Commander Michael Anderson of the Blue team is scheduled to begin work with the MIST experiment overnight. Designed by the Center for Commercial Applications of Combustion in Space at the Colorado School of Mines, Golden, Colo., the experiment will investigate how water mist inhibits the spread of flames. Scientists hope to apply what they learn to designs for improved, lighter-weight fire suppression systems on Earth, as well as for spacecraft-based systems that won't require ozone-damaging chemicals such as Halons.

how their bodies are adapting to the microgravity environment.

Experiments continued with the MEIDEX cameras in the cargo bay observing thunderstorms to capture images of sprites, which are associated with discharges from the tops of thunderclouds into the Earth's upper atmosphere, and with the SOLSE experiment, studying the amount of ozone in the Earth's upper atmosphere by using a special imaging spectrometer in the payload bay to look across the limb of the Earth during specifically scheduled orbits.

Having been awakened just after 5 p.m. EST, McCool, Brown and Anderson planned to continue the more than 80 experiments on board Columbia. The Red team will begin its eight-hour sleep period just after 9 p.m. EST.

This afternoon, flight controllers observed a minor electrical current spike in one of two systems designed to collect and distribute water produced from condensation buildup caused by the operation of the cooling system in the Spacehab Research Module in the cargo bay.

An identical system sprung a leak under the floorboards of Spacehab last night and was shut down. The secondary system had been operating normally until the electrical spike was observed at around 2:15 p.m. A plan was implemented to reconfigure a valve in Columbia, allowing cool air from the shuttle to flow into the science module, thus enabling the module's temperatures to remain at a level that will not require the use of Spacehab's cooling system, while preventing any further buildup of condensation. Later, an air duct was routed from Columbia to the Spacehab to increase the flow of cool air into the science facility.

Flight controllers plan to continue their analysis of the Spacehab cooling issue throughout the night, with no impact expected to science operations.

Aboard the International Space Station, Expedition 6 Commander Ken Bowersox, Flight Engineer Nikolai Budarin and ISS Science Officer Don Pettit entered their third month in orbit today with a full complement of scientific research activities, exercise and routine ISS maintenance work.

The three ISS crewmembers conducted a number of cardiovascular tests, unloaded samples from a Zeolite Crystal Growth experiment in the Destiny laboratory that has completed its work for this Expedition. The Russian Vozdukh carbon dioxide removal system in the Zvezda Module, which shut down last week, is now operating normally following the weekend replacement of a valve. The U.S. segment CO₂ removal system, which has been operating in place of Vozdukh, was powered down as a result of the Vozdukh revival.



S107E05832



S107E05858



S107E05098